

REMARKS

Status Summary

Claims 1-16 and 49-61 were elected by applicants for further prosecution at this time in response to a Restriction Requirement issued by the U.S. Patent & Trademark Office (hereinafter the "Patent Office"). Claims 1-16 and 49-61 have been rejected by the Patent Office.

The present amendment cancels unelected claims 17-48. Applicants reserve the right to prosecute the unelected claims in one or more divisional applications. Claims 13 and 14 are also canceled by the present amendment. New claims 62 and 63 are added by the present amendment. No new matter has been added by the new claims. As such, claims 1, 12, 15, 16, and 49-63 are currently pending in the present application.

Amendment to Specification

The specification has been amended to include the serial number of a U.S. Patent Application incorporated by reference. Although the incorporated application had been previously filed at the time of filing the present application, a serial number had yet to be assigned. No new matter is considered to have been added by the amendment. See *In re Fouche*, 439 F.2d 1237, 169 USPQ 429 (CCPA 1971) (Statement that compound could be "prepared as described in Example I of our application No. ---" adequately incorporated disclosure of previously filed application

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by reference and subsequent amendment to specify serial number and filing date did not introduce new matter into specification.).

These changes have been made to the specification as indicated by the amendment above.

Response to Rejections Under 35 U.S.C. § 103

Finney et al. in view of Rice et al.

Claims 1-13, 15, 16, and 49-53 stand rejected by the Patent Office under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,682,641 to Finney et al., hereinafter referred to as "Finney et al.", in view of U.S. Patent No. 5,972,188 to Rice et al., hereinafter referred to as "Rice et al.". The Patent Office asserts Finney et al. discloses an electrophoresis system comprising each and every element of the rejected claims, except that the Patent Office admits Finney et al. does not teach a system comprising a sample delivery device as recited in the rejected claims.

The Patent Office further asserts Rice et al. discloses a membrane loader for use in applying samples to electrophoresis gels, which is equivalent to the sample delivery device recited in the rejected claims. The Patent Office further asserts it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Finney et al. by incorporating the membrane loader of Rice et al. such that each and every element of the rejected claims would be found in the combined teachings. The Patent Office asserts one of skill in the art would be motivated to make the combination because Rice et al.

teaches the membrane loader disclosed therein provides advantages over the prior art in that it simplifies sample loading onto gels by reducing the dexterity required and it also reduces loading time, among other benefits. See Official Action, pages 3-5.

The contentions of the Patent Office as summarized above with respect to the rejected claims are respectfully traversed as described below.

To establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the cited art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). As admitted by the Patent Office, neither Finney et. al. nor Rice et. al. teach or suggest a gel electrophoresis apparatus comprising an optical densitometer. See Official Action, page 6.

Independent claims 1 and 49 each recite, in part, an apparatus or system, respectively, comprising a first reservoir, a chamber coupled to the first reservoir and having a bottom plate and a top plate in parallel alignment, second reservoir coupled to the chamber, a sample delivery device having a longitudinal axis and having a plurality of tabs extending orthogonally from the longitudinal axis, and an optical densitometer functionally coupled to the chamber. Thus, claims 1 and 49 have been amended to recite an apparatus or system, respectively, comprising an optical densitometer functionally coupled to the chamber. Support for the amendment can be found in claim 14 as originally filed; in Figures 1, 2 and 12; and in the specification at page 10, lines 1-12, and elsewhere. No new matter is believed to have been added by the amendment to the claims. Functionally coupling the optical densitometer to the electrophoresis apparatus provides an advantage of analysis of

the migrating molecules as the gel is electrophoresed as well as facilitating automated and integrated electrophoresis and analysis of samples. As such, samples can be processed and analyzed more quickly and efficiently with less operator intervention than is possible with prior art methods and apparatuses.

Neither Finney et al. nor Rice et al. either alone or in combination teach or suggest an optical densitometer functionally coupled to a chamber of an electrophoresis apparatus as presently recited in independent claims 1 and 49. Therefore, Finney et al. and Rice et al., either alone or in combination, do not teach or suggest each and every element of independent claims 1 and 49. Since all the elements of claims 1 and 49 are neither taught nor suggested by Finney et al. and Rice et al., either alone or in combination, it is respectfully submitted that the rejection of claims 1 and 49 under 35 U.S.C. § 103 based on Finney et al. in view of Rice et al. Applicants therefore respectfully request withdrawal of the rejection of claims 1 and 49 based on Finney et al. in view of Rice et al. Allowance of claims 1 and 49 is also respectfully requested.

With regard to the rejection of claim 13, Applicants note claim 13 has been cancelled, thereby rendering this rejection effectively moot. Since claims 2-12, 15, 16, and 50-53 depend either directly or indirectly from claims 1 and 49 and the cited references do not teach or suggest all the elements of claims 1 and 49 for the reasons stated above, Finney et al. in view of Rice et al. therefore do not teach or suggest all the elements of these dependent claims either. Applicants therefore

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respectfully request withdrawal of the rejection of claims 2-12, 15, 16, and 50-53 under 35 U.S.C. § 103 based on Finney et al. in view of Rice et al. Allowance of these claims is also respectfully requested.

Finney et al. in view of Rice et al. and further in view of Zhang et al.

Claim 14 stands rejected by the Patent Office under 35 U.S.C. § 103(a) as being unpatentable over Finney et al., and Rice et al., as applied to claim 1, and further in view of U.S. Patent No. 4,824,547 to Zhang et al., hereinafter referred to “Zhang et al.”. The Patent Office admits neither Finney et al. nor Rice et al. teach or suggest using an optical densitometer for detection, as previously recited in claim 14. However, the Patent Office argues Zhang et al. discloses a gel electrophoresis system in which an optical densitometer is used to produce an image of a stained gel. See Official Action at page 6, paragraph 4. The Patent Office further argues it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the system of Finney et al. and Rice et al. by using an optical densitometer, as taught by Zhang et al. because “Finney et al. disclosed that their system can be used with known prior art detection methods (Column 17, lines 1-11) and Zhang et al. teach the usefulness of optical densitometry in producing an electronic image of the gel for storage and later analysis.” Official Action, page 6, last paragraph.

The contentions of the Patent Office as summarized above with respect to the rejected claims are respectfully traversed as described below.

Initially, it is noted that claim 14 has been canceled by the present amendment, thereby effectively rendering this rejection moot. However, an element of claim 14 has been incorporated into independent claims 1 and 49 and therefore applicants wish to address the Patent Office's assertion with regard to this combination of references.

To establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). As discussed in detail above, claims 1 and 49 have been amended to recite, in part, an apparatus or system, respectively, comprising an optical densitometer functionally coupled to a chamber of the apparatus or system. The Patent Office argues Zhang et al. discloses using an optical densitometer to produce an image of a stained gel for use in a gel electrophoresis system. However, applicants respectfully submit that, Zhang et al. does not teach or even suggest functionally coupling an optical densitometer to the chamber of a gel electrophoresis apparatus, as recited in claims 1 and 49.

Zhang et al. teaches a method and apparatus for extracting proteins and related materials from gel core spots, such that a highly purified protein becomes available for further processing, analysis or use. See Zhang et al. at Column 2, lines 44-48. The teachings of Zhang et al. appear to only tangentially relate to gel electrophoresis apparatuses and analysis of the electrophoresed molecules in that the method and apparatus disclosed by Zhang et al. requires an electrophoresed gel for protein extraction. Zhang et al. does not appear to teach or suggest functionally

coupling an optical densitometer to a gel electrophoresis apparatus. Rather, Zhang et al. appears to teach using an optical densitometer as an analytical option after completion of gel electrophoresis and removal of the gel from the electrophoresis apparatus.

Zhang et al. teaches that two-dimensional electrophoresis of a protein mixture results in a protein map made up of gel spots on a gel slab. See Zhang et al. at Column 11, Lines 6-8. Zhang et al. further teaches that the protein map can then be scanned with an optical densitometer for providing data useful for storage and further processing in a computer. *Id.* at Column 11, lines 8-11. In order to perform analysis using an optical densitometer Zhang et al. teaches, "gel slab holder assembly 116 is removed from the tank 114, and the gel slab 92 is peeled away from the glass plates 94 and 96." *Id.* at Column 10, lines 52-55 (emphasis added). Only after the gel is removed from the electrophoresis assembly can the gel spots of the protein map then be stained and the protein map photographed and optical densitometry performed, according to the disclosure of Zhang et al. See *Id.* at Column 10, line 52 - Column 11, line 11. As such, only after removal of the gel from the electrophoresis apparatus, staining of the gel, photographing the gel, and analysis of the gel map, are the gel spots are then cored out of the gel and the protein extracted from the cores using the extracting apparatus disclosed by Zhang et al.

Therefore, Zhang et al. teaches first removing an electrophoresed gel from the gel electrophoresis apparatus; then staining, photographing, and gel analysis; and then coring protein samples from the gel and extracting the protein using the

apparatus disclosed therein. As such, Zhang et al. does not teach or even suggest functionally coupling an optical densitometer to a chamber of an electrophoresis apparatus as recited in the pending claims. In contrast, Zhang et al. appears to teach away from functionally coupling an optical densitometer to a chamber of a gel electrophoresis apparatus in that Zhang et al. teaches removing the gel from the apparatus prior to any analysis, including optical densitometry. Further, the methods and apparatus taught by Zhang et al. require removal of the electrophoresed gel from the apparatus so that the protein samples can be cored from the gel and applied to the apparatus taught therein. As such, not only does Zhang et al. not teach or suggest functionally coupling an optical densitometer to a gel electrophoresis apparatus, one of skill in the art following the teachings of Zhang et al. would likely be discouraged from attempting to couple an optical densitometer to a chamber of a gel electrophoresis apparatus because Zhang et al. repeatedly teaches disassembling the apparatus after gel electrophoresis and removing the gel from the apparatus prior to performing any further manipulations or analysis of the gel.

Accordingly, neither Finney et al., Rice et al., nor Zhang et al. teach or suggest an optical densitometer functionally coupled to a chamber of an apparatus or system, as recited in claims 1 and 49. Further, Zhang et al. appears to teach away from coupling an optical densitometer to a gel electrophoresis device in that Zhang et al. teaches disassembling the apparatus and removing the gel prior to any further manipulation of the electrophoresed gel. Since all the elements of claim 1 and 49 are neither taught nor suggested by Finney et al., Rice et al., and Zhang et al. either

alone or in combination, it is respectfully submitted that an obviousness rejection of the presently pending claims cannot be supported by these references. Further, Zhang et al. specifically teaches away from functionally coupling an optical densitometer with a chamber of an apparatus, thereby preventing combination of references in support of an obviousness rejection of the pending claims. Applicants therefore respectfully submit that a *prima facie* case of obviousness in view of the references of Finney, Rice, and Zhang cannot be established with respect to the presently pending claims.

Finney et al. in view of Rice et al. and further in view of Johansson et al.

Claims 54-61 stand rejected by the Patent Office under 35 U.S.C. § 103(a) as being unpatentable over Finney et al., and Rice et al., as applied to claim 49 above, and further in view of the journal article of Johansson et al. ("Electrophoresis, Crossed Immunoelectrophoresis, and Isoelectric Focusing in Agarose Gels with Reduced Electroendosmotic Flow", Anal. Biochem., Vol. 59; pages 200-213; (1974)), hereinafter referred to as "Johansson et al.". The Patent Office asserts Finney et al., and Rice et al. disclose all the elements of the rejected claims except that Finney et al. and Rice et al. do not disclose separation medium of the claimed compositions or medium adapted for separation of molecules of the claimed molecular weight ranges. However, the Patent Office asserts that Johansson et al. disclose using mixtures of agarose and linear polyacrylamide to separate proteins, and the agarose and polyacrylamide percentages fall within claimed ranges. Further, the proteins separated fall within the claimed molecular weight ranges, as asserted by the Patent

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Office. See Official Action, page 7, paragraph 4. The Patent Office further asserts it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Finney et al. and Rice et al. with the particular medium taught by Johansson et al. because Finney et al. specifies no gel to be used their system, thereby suggesting that gels known in prior art would be suitable. See Official Action, page 7 last paragraph - page 8 first full paragraph.

The contentions of the Patent Office as summarized above with respect to the rejected claims are respectfully traverse as described below.

To establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). As discussed in detail above, Finney et al. and Rice et al., either alone or in combination do not teach or suggest an optical densitometer functionally coupled to a chamber of a system, as recited in claim 49, from which claims 54-61 depend either directly or indirectly.

Johansson et al. does not remedy the deficiencies of Finney et al. or Rice et al.. Johansson et al. teaches an ion exchange method for preparation of agarose and a method for isoelectric focusing of proteins and gels made from a mixture of agarose and acrylamide. Johansson et al. does not teach or suggest an optical densitometer functionally coupled to a chamber of a gel electrophoresis system, as recited in claim 49 and claims depending therefrom.

As such, applicants respectfully submit Finney et al., Rice et al., and Johansson et al. either alone or in combination do not teach or suggest each and

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every element of rejected claims 54-61. Applicants therefore respectfully request withdrawal of the rejection of claims 54-61 based on the combination of references. Applicants further request allowance of claims 54-61.

New Claims

New claims 62 and 63 have been added by this amendment as indicated above.

Claim 62 is an independent claim reciting an apparatus comprising, in part, a first reservoir; a chamber coupled to the first reservoir; a second reservoir coupled to the chamber; and a sample delivery device comprising a comb having a longitudinal axis and comprising a plurality of tabs extending from an end of the comb orthogonal to the longitudinal axis and a reinforcer that at least partially overlaps with and is bonded to a side of the comb so as to form a laminate region of the sample delivery device.

Claim 63 is an independent claim reciting a system comprising, in part, a first reservoir; a chamber coupled to the first reservoir; a separation medium; a second reservoir coupled to the chamber and having an opening adapted to receive a plurality of tabs; and a sample delivery device comprising a comb having a longitudinal axis and comprising a plurality of tabs extending from an end of the comb orthogonal to the longitudinal axis, wherein the plurality of tabs is disposed at least partially in the opening and a reinforcer that at least partially overlaps with and is

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bonded to a side of the comb so as to form a laminate region of the sample delivery device.

Support for the new claims can be found throughout the application and in particular in claims 1 and 49 as originally filed, as well as Figures 3A, 3B, 4A, 4B and 6. Further support for the new claims can be found in the specification at page 10, lines 16-27 and elsewhere. No new matter is considered to have been added.

It is respectfully submitted that new claims 62 and 63 are allowable over the prior art. In particular, an aspect of new claims 62 and 63 includes a sample delivery device comprising, in part, a reinforcer that at least partially overlaps with and is bonded to a side of a comb so as to form a laminate region of the sample delivery device. The claimed sample delivery device provides an advantage of increased structural rigidity and ease of handling in the reinforcer element and laminate structure provided as part of the sample delivery device. These elements are not provided by the cited art. For example, Rice et al. teaches in one embodiment a sample loader 500 comprising a substrate 502 and a membrane 506, wherein the membrane is attached to the bottom of the substrate. See Rice et al. at col. 10, lines 7-13 and Figure 6b. Rice et al. does not teach a reinforcer at least partially overlapping and bonded to a side of a comb so as to form a laminate region, as recited in new claims 62 and 63.

Allowance of claims 62 and 63 is respectfully therefore requested.

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CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. 50-0426.

Respectfully submitted,

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